

Appl. No. 10/729,668
Amdt. dated June 23, 2005
Reply to Office Action mailed May 2, 2005

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently amended): A method for working on a spine, said method comprising:

providing an apparatus a retractor having a distal portion and an expandable bladder coupled to the distal portion, the expandable bladder having surfaces configured to engage and spread adjacent vertebrae apart;

positioning the expandable bladder between the adjacent vertebrae; and
inflating the expandable bladder to spread the adjacent vertebrae apart.

Claim 2 (Original): The method of claim 1, further comprising operating between the adjacent vertebrae.

Claim 3 (Previously presented): The method of claim 2, further comprising operating between the adjacent vertebrae while said expandable bladder is inflated.

Claim 4 (Original): The method of claim 2, wherein operating between the vertebrae comprises removing tissue from between the vertebrae.

Claim 5 (Original): The method of claim 4, wherein the tissue removed comprises the intervertebral disc.

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Claim 6 (Canceled).

Claim 7 (Withdrawn): The method of claim 6, wherein the bladder of the retractor comprises repositionable rigid surfaces.

Claim 8 (Previously presented): The method of claim 1, wherein the expandable bladder, when inflated, has a shape selected from the group consisting of curved and wedge-shaped.

Claim 9 (Withdrawn): The method of claim 6, wherein the bladder, when inflated, extends around a longitudinal axis of the retractor.

Claim 10 (Previously presented): The method of claim 1, wherein the expandable bladder is spread and arranged for spreading apart the adjacent vertebrae.

Claim 11 (Previously presented): The method of claim 10, wherein the expandable bladder is sized and arranged for enabling removal of intervertebral tissue from between adjacent vertebrae.

Claim 12 (Withdrawn): The method of claim 7, wherein the bladder is formed as an accordion or as a wedge-shaped member.

Claim 13 (Previously presented): The method of claim 1, wherein the expandable bladder is inflated at a pressure from 10 mmHg to 1000 mmHg.

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Claim 14 (Withdrawn): The method of claim 1, further comprising positioning a cannula between the adjacent vertebrae, wherein positioning of the retractor comprises introducing the retractor through a passage of the cannula.

Claim 15 (Previously presented): The method of claim 1, wherein the expandable bladder is inflated without unconfined fluid introduced to the joint.

Claim 16 (Original): The method of claim 1, further comprising introducing instruments between said adjacent vertebrae to perform an operation.

Claim 17 (Previously presented): The method of claim 1, wherein positioning the expandable bladder comprises manipulating a rigid shaft having the bladder at an end thereof.

Claim 18 (Previously presented): The method of claim 1, wherein positioning the expandable bladder comprises manipulating a flexible shaft having the bladder at an end thereof.

Claim 19 (Previously presented): The method of claim 1, wherein the expandable bladder comprises a polymeric material.

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Claim 20 (Currently amended): A method for working on a spine, said method comprising:

positioning a cannula to access the spine;

providing an apparatus a retractor having a distal portion and an expandable bladder coupled to the distal portion, the expandable bladder having surfaces configured to engage and spread adjacent vertebrae apart;

introducing the expandable bladder through the cannula to access the adjacent vertebrae;

positioning the expandable bladder between the adjacent vertebrae;

inflating the expandable bladder to spread the adjacent vertebrae apart; and

operating on the spine using an instrument introduced between the expanded vertebrae.

Claim 21 (Previously presented): The method of claim 20, further comprising operating on the spine between the adjacent vertebrae while said expandable bladder is inflated.

Claim 22 (Original): The method of claim 21, wherein operating on the spine comprises removing tissue from between the vertebrae.

Claim 23 (Original): The method of claim 22, wherein the tissue removed comprises the intervertebral disc.

Claim 24 (Canceled).

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Claim 25 (Previously presented): The method of claim 20, further comprising deflating said expandable bladder and removing the expandable bladder from the spine.

Claim 26 (Currently amended): The method of claim 20, wherein the expandable bladder is disposed at the distalmost end of the ~~retractor apparatus~~.

Claim 27 (Currently amended): A method for working on a spine, said method comprising:

positioning a cannula to access the spine;

providing an apparatus ~~a retractor~~ having an expandable bladder, the expandable bladder having surfaces configured to engage and spread adjacent vertebrae apart;

introducing the expandable bladder through the cannula to access the adjacent vertebrae;

positioning the ~~inflatable retractor apparatus~~ between the adjacent vertebrae; and

inflating the expandable bladder to spread the adjacent vertebrae apart.

Claim 28 (Previously presented): The method of claim 27, wherein the expandable bladder comprises a stretchable material so that it at least partially collapses when deflated.

Claim 29 (Previously presented): The method of claim 27, wherein the expandable bladder comprises a material which does not stretch.

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Claim 30 (Previously presented): The method of claim 27, wherein inflating the expandable bladder pushes soft tissue out of the way.

Claim 31 (Original): The method of claim 27, further comprising introducing at least one instrument between the adjacent vertebrae and operating between the adjacent vertebrae with said instrument.

Claim 32 (Previously presented): The method of claim 31, further comprising operating between the adjacent vertebrae while said expandable bladder is inflated.

Claim 33 (Original): The method of claim 31, wherein operating between the vertebrae comprises removing tissue from between the vertebrae.

Claim 34 (Original): The method of claim 33, wherein the tissue removed comprises the intervertebral disc.

Claim 35 (Previously presented): The method of claim 33, wherein the expandable bladder remains inflated while the instrument is introduced to perform the operation.

Claim 36 (Previously presented): The method of claim 33, wherein the expandable bladder is removed prior to or while the instrument is introduced to perform the operation.

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Claim 37 (Currently amended): The method of claim 31, further comprising contracting the expandable bladder; and removing the ~~retractor apparatus~~ from the spine.

Claim 38 (Currently amended): A method to spread adjacent surfaces in a bone joint, said method comprising:

providing an apparatus a retractor having an expandable bladder, the expandable bladder having surfaces configured to engage and spread adjacent surfaces apart;

positioning the inflatable bladder between the adjacent surfaces in the bone joint;
and

inflating the expandable bladder to spread the adjacent surfaces apart.

Claim 39 (Previously presented): The method of claim 38, wherein the expandable bladder is positioned between adjacent vertebrae.

Claim 40 (Previously presented): The method of claim 39, wherein inflating the expandable bladder causes the expandable bladder to directly engage a surface on the adjacent vertebrae.

Claim 41 (Previously presented): The method of claim 40, wherein inflating the expandable bladder causes the expandable bladder to engage surfaces on each of the adjacent vertebrae.

Claim 42 (Previously presented): The method of any of claims 38, further comprising removing the expandable bladder after the adjacent surfaces have been spread.

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Claim 43 (Withdrawn): The method of any of claims 38, wherein a portion of the bladder of the retractor comprises at least one rigid surface.

Claim 44 (Withdrawn): The method of claim 43, wherein the bladder comprises a plurality of rigid surfaces connected by regions having differing degrees of resistance to straightening and flexing.

Claim 45 (Withdrawn): The method of claim 44, wherein the bladder is formed as an accordion.

Claim 46 (Withdrawn): The method of claim 38, wherein the bladder of the retractor has areas of rigidity interleaved with areas of more elasticity.

Claim 47 (Original): The method of claim 38, wherein the bladder is formed from a substantially inelastic material does not stretch when inflated.

Claim 48 (Previously presented): The method of claim 38, wherein the expandable bladder is inflated at a pressure from 10 mmHg to 1000 mmHg.

Claim 49 (Currently amended): The method of claim 38, further comprising positioning a cannula between the adjacent vertebrae, wherein positioning of the retractor apparatus comprises introducing the retractor apparatus through a passage of the cannula.

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Claim 50 (Previously presented): The method of claim 38, wherein the expandable bladder is inflated without unconfined fluid introduced to the joint.

Claim 51 (Original): The method of claim 38, further comprising visualizing the space between said adjacent surfaces with a fiberoptic light and camera.

Claim 52 (Original): The method of claim 38, further comprising introducing instruments to a space between said adjacent surfaces to perform an operation.

Claim 53 (Original): The method of claim 38, wherein positioning the bladder comprises manipulating a rigid shaft having the bladder at an end thereof.

Claim 54 (Original): The method of claim 38, wherein positioning the bladder comprises manipulating a flexible shaft having the bladder at an end thereof.

Claim 55 (Original): The method of claim 38, wherein the bladder comprises a polymeric material.

Claim 56 (Original): The method of claim 38, wherein the joint is a knee joint.

Claim 57 (Previously presented): The method of claim 56, wherein the expandable bladder has a wedge-shape when inflated to separate surfaces of a femur and a tibia.

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Claim 58 (Previously presented): The method of claim 57, wherein at least one wedge-shaped expandable bladder is inflated between the femur and the tibia.

Claim 59 (Currently amended): A method for enlarging a space between adjacent surfaces in a joint, said method comprising:

positioning a cannula to access the joint;
introducing a bladder into the joint through the cannula, the expandable bladder having surfaces configured to engage and spread adjacent surfaces apart;
inflating the bladder such that the bladder engages the adjacent surfaces and distends the joint to enlarge the space; and
removing the bladder from the joint.

Claim 60 (Previously presented): The method of claim 59, wherein the bladder is inflated without unconfined liquid present in the joint.

Claim 61 (Original): The method of claim 59, further comprising visualizing the space with a fiberoptic light and camera.

Claim 62 (Original): The method of claim 61, wherein a fiberoptic scope is introduced through the cannula.

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Claim 63 (Original): The method of claim 61, further comprising introducing instruments to the space to perform an operation.

Claim 64 (Original): The method of claim 59, wherein introducing the bladder comprises manipulating a rigid shaft having the bladder at an end thereof.

Claim 65 (Original): The method of claim 59, wherein introducing the bladder comprises manipulating a flexible shaft having the bladder at an end thereof.

Claim 66 (Original): The method of claim 59, wherein the bladder comprises a polymeric material.

Claim 67 (Original): The method of claim 59, wherein the bladder comprises an elastic material so that it at least partially collapses when deflated.

Claim 68 (Original): The method of claim 59, wherein the bladder comprises a substantially inelastic material.

Claim 69 (Original): The method of claim 59, wherein the bladder remains inflated while the instruments are introduced to perform the operation.

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Claim 70 (Original): The method of claim 59, wherein the bladder is removed prior to or while the instruments are introduced to perform the operation.

Claim 71 (Original): The method of claim 70, further comprising applying a vacuum to deflate the bladder prior to withdrawing the bladder.

Claim 72 (Original): The method of claim 59, wherein inflating the bladder moves soft tissue out of the way.

Claim 73 (Original): The method of claim 59, wherein the joint is between two vertebrae in a spine, wherein inflation of the bladder spreads the two vertebrae apart.

Claim 74 (Original): The method of claim 73, further comprising removing a spinal disc between the vertebrae.

Claim 75 (Original): The method of claim 59, wherein the joint is in a knee.

Claim 76 (Original): The method of claim 75, wherein the bladder has a wedge-shape when inflated to separate surfaces of a femur and a tibia.

Claim 77 (Previously presented): The method of claim 76, wherein at least one wedge-shaped bladder is inflated between the femur and the tibia.

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Claim 78 (Currently amended): A method for working within a bone joint, said method comprising:

providing an apparatus a retractor having an expandable bladder, the expandable bladder having surfaces configured to engage and spread adjacent surfaces apart;

positioning the expandable bladder between the adjacent surfaces of the bone joint;

inflating the expandable bladder to spread the adjacent surfaces to enlarge a working space in said joint; and

operating on the joint using an instrument introduced into the enlarged working space.

Claim 79 (Previously presented): The method of claim 78, further comprising removing the expandable bladder after the joint has been operated on.

Claim 80 (Canceled).

Claim 81 (Original): The method of claim 78, wherein the joint is a knee joint.

Claim 82 (Original): The method of claim 78, wherein the joint is between adjacent vertebrae in a spine.

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Claim 83 (Original): The method of claim 78, wherein operating on the joint comprises removing tissue or bone.

Claim 84 (Previously presented): The method if of claim 82 83, wherein the tissue comprises a spinal disc.

Claim 85 (Withdrawn): The method of claim 78, wherein a portion of the bladder of the retractor comprises at least one rigid surface.

Claim 86 (Withdrawn): The method of claim 85, wherein the bladder has a plurality of rigid surfaces connected by regions having differing degrees of resistance to straightening and flexing.

Claim 87 (Withdrawn): The method of claim 86, wherein the bladder is formed as an accordion.

Claim 88 (Withdrawn): The method of claim 78, wherein the bladder of the retractor has areas of rigidity interleaved with areas of more elasticity.

Claim 89 (Original): The method of claim 78, wherein the bladder is formed from a substantially inelastic material.

Claim 90 (Original): The method of claims 78, wherein the bladder is inflated at a pressure from 10 mmHg to 1000 mmHg.

Claim 91 (Currently amended): The method of claim 78, further comprising positioning a cannula between the adjacent vertebrae, wherein positioning of the inflatable ~~retractor apparatus~~ comprises introducing the retractor apparatus through a passage of the cannula.

Claim 92 (Original): The method of claim 78, wherein the bladder is inflated without unconfined fluid introduced to the joint.

Claim 93 (Original): The method of claim 78, further comprising visualizing the space with a fiberoptic light and camera.

Claim 94 (Original): The method of claim 93, wherein a fiberoptic scope is introduced through a cannula.

Claim 95 (Previously presented): The method of claim 78, wherein positioning the bladder comprises manipulating a rigid shaft having the bladder at an end thereof.

Claim 96 (Original): The method of claim 78, wherein positioning the bladder comprises manipulating a flexible shaft having the bladder at an end thereof.

Claim 97 (Original): The method of claim 78, wherein the bladder is composed of a polymeric material.

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Claim 98 (Original): The method of claim 78, wherein the bladder remains inflated while the instruments are introduced to perform the operation.

Claim 99 (Original): The method of claim 78, wherein the bladder is removed prior to or while the instruments are introduced to perform the operation.

Claim 100 (Previously presented): The method of claim 99, further comprising applying a vacuum to deflate the bladder prior to withdrawing the bladder.

Claim 101 (Original): The method of claim 78, wherein inflating the bladder moves soft tissue out of the way.